

[0120] Moreover, according to exemplary embodiments, noise event signals may be counted based on a type of the noise event signals, and a threshold voltage value may be controlled. Thus, it is possible to determine an optimum ON threshold voltage corresponding to an ON event signal and an optimum OFF threshold voltage corresponding to an OFF event signal.

[0121] Furthermore, according to exemplary embodiments, a threshold voltage may continue to be controlled until a number of noise event signals satisfies a predetermined condition, and thus it is possible to determine a threshold voltage optimized for a sensing core.

[0122] In addition, according to exemplary embodiments, a threshold voltage control apparatus may be designed to be located outside a vision sensor, and thus it is possible to control a threshold voltage used in the vision sensor while using the vision sensor without a change.

[0123] In addition, the exemplary embodiments may also be implemented through computer-readable code and/or instructions on a medium, e.g., a computer-readable medium, to control at least one processing element to implement any above-described embodiments. The medium may correspond to any medium or media that may serve as a storage and/or perform transmission of the computer-readable code.

[0124] The computer-readable code may be recorded and/or transferred on a medium in a variety of ways, and examples of the medium include recording media, such as magnetic storage media (e.g., ROM, floppy disks, hard disks, etc.) and optical recording media (e.g., compact disc read only memories (CD-ROMs) or digital versatile discs (DVDs)), and transmission media such as Internet transmission media. Thus, the medium may have a structure suitable for storing or carrying a signal or information, such as a device carrying a bitstream according to one or more exemplary embodiments. The medium may also be on a distributed network, so that the computer-readable code is stored and/or transferred on the medium and executed in a distributed fashion. Furthermore, the processing element may include a processor or a computer processor, and the processing element may be distributed and/or included in a single device.

[0125] The foregoing exemplary embodiments are examples and are not to be construed as limiting. The present teaching can be readily applied to other types of apparatuses. Also, the description of the exemplary embodiments is intended to be illustrative, and not to limit the scope of the claims, and many alternatives, modifications, and variations will be apparent to those skilled in the art.

What is claimed is:

1. A threshold voltage control method comprising:
  - receiving noise event signals from a sensing core, the sensing core sensing a portion of a moving object, and generating an event signal;
  - determining a type of the noise event signals;
  - determining a number of the noise event signals based on the type of the noise event signals;
  - determining whether the number of the noise event signals satisfies a condition; and
  - controlling a threshold voltage value corresponding to the noise event signals in response to the determining that the number of the noise event signals does not satisfy the condition.

2. The threshold voltage control method of claim 1, wherein the noise event signals are output from the sensing core on which light having a constant intensity is incident.

3. The threshold voltage control method of claim 1, wherein the determining the type of the noise event signals comprises determining each of the noise event signals as either an ON event signal or an OFF event signal.

4. The threshold voltage control method of claim 1, wherein the determining the number of the noise event signals comprises:
  - determining a number of ON event signals among the noise event signals; and
  - determining a number of OFF event signals among the noise event signals.

5. The threshold voltage control method of claim 1, wherein the controlling the threshold voltage value comprises increasing or decreasing the threshold voltage value by a value based on a type of a transistor included in the sensing core.

6. The threshold voltage control method of claim 1, wherein the condition comprises at least one among:
  - an allowable number of noise event signals in a period of time; and
  - a ratio between a number of ON event signals and a number of OFF event signals among the noise event signals.

7. The threshold voltage control method of claim 6, wherein the sensing core generates the ON event signals in response to the sensing core determining that an amount of an increase in an intensity of light incident on the sensing core is greater than a first threshold variation, and
  - the sensing core generates the OFF event signals in response to the sensing core determining that an amount of a decrease in the intensity of the light incident on the sensing core is greater than a second threshold variation.

8. The threshold voltage control method of claim 1, further comprising transmitting the threshold voltage value to a bias generator, the bias generator generating a threshold voltage based on the threshold voltage value, and providing the threshold voltage to the sensing core.

9. The threshold voltage control method of claim 1, wherein the sensing core generates an event signal based on an operating point that is determined based on the threshold voltage value.

10. The threshold voltage control method of claim 1, wherein the receiving the noise event signals, the determining the type of the noise event signals, the determining the number of the noise event signals, the determining whether the number of the noise event signals satisfies the condition, and the controlling the threshold voltage value are repeatedly performed until it is determined that the number of the noise event signals satisfies the condition.

11. The threshold voltage control method of claim 1, further comprising storing the threshold voltage value in a bias generator in response to the determining that the number of the noise event signals satisfies the condition, the bias generator providing the threshold voltage to the sensing core.

12. The threshold voltage control method of claim 1, wherein the sensing core is included in an event-based vision sensor generating an event signal in response to an event in which light that is received from the object asynchronously changes.